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281 [412] have been cut along each border of the neck, aids in stretching this tough section of the hide. Excess moisture is scraped off.

281 237 Tan has been previously prepared. Fresh deer brains are roasted and mixed into a ball of yucca fiber. The raw marrow from the spinal canal is mixed into another ball. After being dried on the coals, these will keep indefinitely. The brain is used before the marrow. The brain and marrow of a single deer is ample to tan its hide; half is sufficient, but if the skin is not soft enough, more must be used.

281 One of these balls is worked up in cold water into a soapy liquor. Spraying mouthfuls of this over the hair side, as well as the flesh side at the ends, the skin is rolled up from the neck and tail inward. The legs which protrude from the double roll are wrapped around it to prevent drying out. After being set aside long enough for the tan to soak through, it is spread in the sun, hair side up, to dry somewhat. Now it is straightened, hung over a rail in the sun, and vigorously rubbed and pulled until soft and pliable. The seated tanner catching the skin under his feet stretches it in every direction. Rubbing and working with the fingers creates considerable friction which presumably melts the grease well into the pores. After a second working over the whole surface, it is laid flesh side up to dry in the sun. While rubbing the skin, at which [476] several friends may help, they sing:—

[539] Wâtim'a wa'a'agadj ahâwamuhavi
(a hero's name) he walks up in the water (i.e., the Colorado).

ya'i'vu'i'wîa'

This completes the tanning, which occupies the day. During the whole process care has been taken to prevent the white skin from being soiled, resting it on an old blanket or heap of leaves. Skins are traded while yet [438] a little stiff, i.e., without the final rubbing,* presumably because the fineness of finish depends solely on the amount of labor one wants to expend on it—and this is left to the ultimate consumer.

If it is desired to stretch the skin somewhat, little slits are cut entirely around its edges, and it is buried in damp earth over night, and pegged out in the morning. Moccasins, etc., which stiffen after a wetting, [294] are similarly buried over night and worked pliable in the hands next day.[1]

Mountain lion and deerskins are also tanned with the hair on. The skin is fleshed, after a little water is blown over the flesh side to soften it. (It must never be soaked.) After brain tan is sprayed over the flesh

[171] [1] The Navaho bury moccasins in the earth to make them pliable (Franciscan Fathers, 806).

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MEASUREMENTS, TIME RECKONING, DIRECTIONS, AND COLORS

A number of measurements are in use. These have no names. The finger span, from the tip of the thumb to the tip of the middle finger, and the hand length, from the tip of the middle finger along the palm to the wrist, are used in measuring arrow foreshafts, for example. Finger width, that is of the first two fingers, gives the width of a bow. The arm length, from the tip of the middle finger along the inside of the arm to the shoulder joint, gives that of the arrowshaft. The span of the arms, i.e., between the outstretched hands, is used to measure bark-skins, the curves being measured in finger spans. The half arm span, from the sternum to the finger tips, is half the length of a bow. Steps are used in measuring houses, etc. Formerly the foot length was not in use. The Hopi use [171] the forearm to measure the length of ears of corn when trading, but the Havasupai make no use of this measurement. 804

By way of a device for laying out lines, for example, in making a woman's dress, the bow is used: the bark furnishes curved lines, the string straight ones. [294]

I have not observed that the fingers or other objects are used in counting. Of course counters are used in certain games, but not because they cannot reckon without them. Beside the numerals given below,[1] fractions (at least a half) are named. 802

1 hl'tá
2 xuwígà
3 hũmógà
4 hop'á
5 ßtt'ãpà
6 tacpê'
7 xuwagacpê'k
8 humugºepê'k
9 halßßdia
10 viwa"avà
20 wavàhuágà or xuágivuwígà

[1] See also Harrington, (a), 894.

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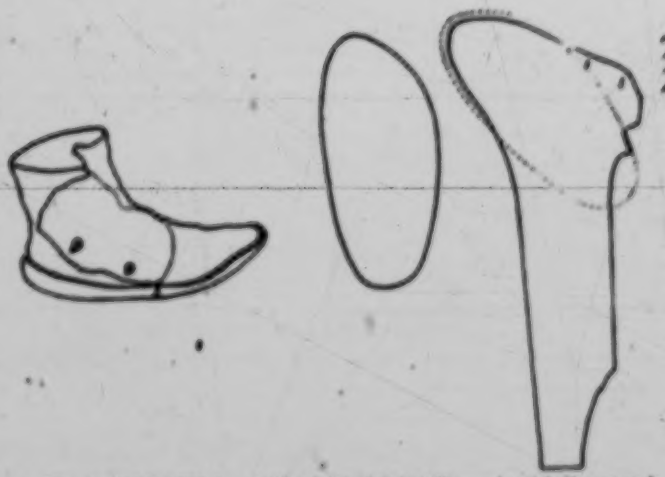

Fig. 41 (80.9-1866a). A Man's Hard-Soled Moccasin with Upper and a Diagram showing the Method of Construction.

Fig. 42 (80.9-1776). A Man's Moccasin with Single Piece Upper cut to Form a Short Tongue.

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DRESS AND ADORNMENT

CLOTHING

Both sexes are moderately well clothed, in fact, Garcés was struck 291
in 1776 with their contrast in this respect to the scantily clad Colorado River tribes.[1] A man wears a headband, shirt, breechclout, moccasins, leggings, and in more recent times, trousers. A woman's dress is a short under-apron, a dress consisting of two aprons, a long one worn in front and a shorter one in the rear, moccasins, and blanket. Young children go entirely naked; at six or seven boys are given shirts, and as they approach puberty they don nether garments. Girls assume complete dress earlier than boys. There are no stylistic differences of clothing or hair dressing marking maidens from wives.

Children run barefoot. Ordinarily women go barefoot about the camp where the sand is soft, but wear their moccasins to the fields or on journeys. Men, on the other hand, are never without them.

Men usually take pains to avoid exposure. The breechclout is worn at all times, even in the sweatlodge and when bathing. Women are equally careful to retain the under-apron, sleeping, bathing, and in the sweatlodge. The dress fashioned of two aprons is open down the side and exposes its wearer's thighs when seated: the front apron is drawn back between the legs.

All skin clothing is made by men, for the whole skin industry from 294
flaying the carcass to the manufacture of women's dresses[2] is in the 281
hands of the men. 462

The man's shirt (*sîguatá*) seems to have been based on the poncho 291
type of the Plains, but only variants resembling European garments are 294
now extant. Cushing observed that the shirt was [177]

> made from a single deerskin, a transverse slit in the center serving as a neck-hole; the sleeves, of two pieces of the same material, heavily fringed, are attached to the edge of the skin, either side of the neck-hole, and open down as far as the elbows. Save the seams at the shoulders and from the elbows to the wrists, no sewing is necessary in this peculiar coat; yet it is made to fit admirably by means of a belt or band, with which the ends falling down front and back are gathered about the waist.[3]

I was told that shirts are also made of two skins sewed together along the straight shoulders and down the sides. True sleeves are inserted. Triangular flaps were added to the neck hole front and back; that in the front is said to have been somewhat the broader. The type now in use

[1] Coues, 435.
[2] Compare the Western Apache (Basehart, 48, 122). [Text continues on p. 185]
[3] Cushing, 341, 344.

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291
177

Fig. 87 (80.3-1267). A European Variation of the Plains Type of Man's Shirt. (The neck flap is lifted to show its decoration).

294

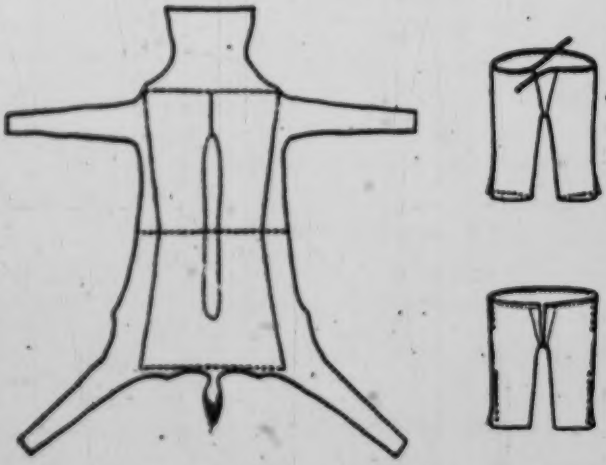

Fig. 88. Diagram illustrating the Cutting and Construction of a Man's Trousers.

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is a coat, split down the front, and lacks the front flap (Fig. 37). All 291
seams are sewed with a running stitch; the two raw edges of adjacent 294
parts which protrude on the outside are slit into fringes. Two pieces
to be cut into long fringes are inserted in the seam under each sleeve.
The only other decoration is on the triangular flap (*mukhiipʌva*, collar
tail). Some of these are beaded (*supoóla*, beads), the design having no [531]
significance. Others have a narrow green line (using a copper ore) painted
around the margin and all are fringed. Another type of shirt was even
more definitely a poncho. A buckskin was folded in half, a slit cut for the
head, the legs cut off and sleeves added, and slit down the front like a coat.

Warmer shirts are made of deerskins, tanned with the hair on, and
worn with the hair side out.

The breechclout is a strip of buckskin or cotton cloth obtained from
the Hopi,[1] about 30 cm. wide, and with short flaps hanging over the [439]
belt cord fore and aft.[2] These flaps are never decorated. Breechclouts
are worn at all times, even with trousers, when the flaps hang inside.

Trousers (*hpil mikiól*, buckskin trousers) are patterned ultimately [177]
on early Spanish models; short waisted, knee length, and open at the
knees. One type is cut from a doubled deerskin (Fig. 38); one of the
duplicate pieces, the front, is then cut in two from waist to crotch. The
seams are down the inside and outside of the leg; the waist is gathered
somewhat; and a separate belt, 5 cm. wide, is added. This garment
hangs just below the knee; the outer seams being open for a short
distance along the leg. The trousers are open in front, failing to meet
at the belt by about 10 cm., but this is covered by the breechclout. A
second type has a triangular piece inserted in this space; this is then
split. In this type the sewing of the outer seam is not continuous, and
silver buttons are also added for decorative effect.

Some men affect Navaho dress; the knee length leggings bound with 177
woven ribbons, the broad belt with silver bosses, the silver studded 291
wristlet, rings, and the turquoises and shell necklaces of the Pueblo and 301
Navaho.

The woman's dress is really two aprons; that in front reaching 291
from breast to ankles, that behind hanging from the waist. These are 294
belted with a Hopi woven belt. The front piece resembles a butcher's [439]
apron; a deerskin is hung from the neck by a broad loop, with a thong
holding it about the waist[3] (Fig. 39). The neck of the skin is turned

[1]Neither the cotton sometimes grown in the canyon nor mountain sheep wool are woven. [286]
[2]The Havasupai state that the Mohave use long flaps.
[3]Cushing, (a), 548.

[Text continues on p. 187]

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back on the breast in a broad decorated flap; the sides of the apron are fringed and the bottom slit into long fringes. Both the neck loop and waist thong are fastened permanently, so that the garment must be put on over the head. The woman's dress is made by the men. 291 294

The skin is worn flesh side out. It is laid flat on the ground and lines drawn with the aid of a bow, the back furnishing these for the curved bottom and the string the straight lines. Lines are marked with a wet stick or charcoal; formerly paint was used as well. The length of the dress is measured on the woman for whom it is intended, so that the breast flap may be turned down at the top of the sternum. The fringe on the breast flap consists of short broad tabs; the line delimiting them being heavily scored and wetted on the wrong side, otherwise, since the skin of the neck is thick, they do not swing freely. The fringes at the bottom are first cut in broad strips; these are drawn and cut parallel to the median line, not radially. Subsequently these strips are slit into narrow fringes while resting on a block of wood. The two at the ends however are not slit lengthwise, but their edges are cut obliquely in short fringes. Each edge of the apron is similarly cut into short oblique fringes. A neck loop, 2 cm. wide, is adjusted on the woman's person and sewed in place with a thong. The tab ends of this loop which hang over the breast flap are sometimes slit into strings on which short bone tubes or dewclaws are hung as rattles (*atsuk*). On old women's dresses these jinglers include deer eyes (which lack special significance). They are prepared by cutting a tiny hole to drain the fluid within, blowing them up to dry, inserting a kernel of corn, and tying the aperture. Similar rattles are also threaded on the side fringes for a short distance down from the belt. The scored line on the breast flap is sometimes filled with paint; other ornamental lines are sometimes painted on it. The loops in the edges of the neck skin formed by the tanning pegs are also ornamental. A thong is tied between the borders of the skin to go in back of the waist. The outside of the garment then receives a liberal coating of red paint. One such dress took five hours to make. 291 294 301 531 [237]

The back piece is an apron hanging from waist to ankles. Like the front piece, the fringes at the bottom are long and those at the side short and cut obliquely. A long extension at each side of the waist line, cut from the length of the skin, serves as a tie-string. Two long horn-shaped pieces, with their edges serrated, are added at the middle of the waist line so as to fall down over the outside of the garment by way of decoration. The rear apron is put on before the front apron which then laps the back piece at each side. A buckskin belt of semilunar shape, slit in fringes 291 294

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(almost an additional apron), is arranged to hang in front. A Hopi woven belt is then added as a girdle.

Strings of rattles are tied at various points along the woman's belt. These are small deer or mountain sheep hoofs, or sometimes tubes cut from the leg bones of jack-rabbits, cotton-tails, and wildcats, and in recent times metal jinglers. They are strung on the fringes of a doubled length of skin (Fig. 40b).

The underskirt is a short, somewhat crescentic apron which hangs in front to just above the knees. Like the back apron, it has two extensions for tie-strings. The actual tie is made with a thong which passes

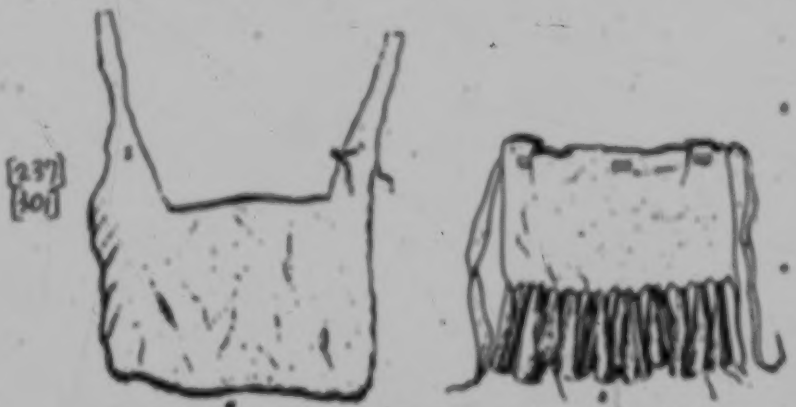

Fig. 40 a (30.2-1862), b (30.2-1862). A Woman's Underskirt and Rattles usually tied to a Woman's Belt.

through both strings. The waist line is hemmed (sewed with a narrow thong in a running stitch), the sides and bottom fringed, and the tie-strings serrated (Fig. 40a).[a]

Small blankets woven of rabbitskins are worn as robes by the women. On occasion a man would wrap a blanket about his body, passing it over the right shoulder and under the left arm.[1] These also furnish bedding. Jack-rabbit (*dpâld*) and cotton-tail (*Adlô'o*) skins are cut round and round into long strips. Two of these are rolled together on the thigh into a cord. This is wound to and fro between two parallel rows of pegs, and strings, obtained from the Hopi, are twined through

[a] Nothing is never fashioned of rabbitskins

[Text continues on p. 181]

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this warp at intervals of 5 cm. Blankets are fairly rectangular; specimens measuring 78 by 125 cm.; 128 by 140 cm., and a mattress 65 cm. square. The sixty rabbitskins or so necessary for a good-sized blanket are gathered from time to time. The skins are not tanned. Such blankets are quite heavy. Women do not like to go without their shawls, at least outside the camp, but I doubt that the sentiment is as strong as at Zuñi.[1]

Hard sole moccasins are the universal footgear.[2] Women sometimes wear the man's type, but their regular style is like that of Pueblo women, with a long upper which is wound around the leg. The man's moccasin

a b

Fig. 42 a (30.2-1276a), b (30.2-1277a). Woman's Moccasins with Ankle Flaps.

consists of two pieces. The sole is made of the neck skin, the thickest part of a deer hide. In all types the sole comes well up the sides and toe, being shaped and puckered. Three styles are used in the upper of men's moccasins (*mahdupd'*, sing. or pl.). The commonest is a single piece lapping at the outside of the foot, where it is fastened with Navaho silver buttons (Fig. 41).[3] A short thong is tied through upper and sole at the bottom of the opening for reinforcement. A second type also has a single piece upper, but so cut as to form a short tongue, which the upper laps at the inside of the foot (Fig. 42). The third type resembles that of the

[1] The modern shawl hangs to the heels like that of the Colorado River tribes. It is formed of four handkerchiefs sewed together. Two corners are tied under the chin. The modern dress is also like that of the river people. An undershirt is universally worn.

[2] Neither sandals nor moccasins, nor basketry shoes are made.

[3] This is the type shown by Winslow, (a), Fig. 97, for the Zuñi.

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woman's moccasin. This differs from the woman's type only in that the ankle piece is short. Two sets of tie strings are furnished in the older style of fastening as shown in Fig. 42; a short thong ties into a corresponding hole, a long thong is wrapped several times around the ankle before tying. The tops of moccasins were sometimes turned down inside to prevent a finished edge. Porcupine quill decoration (*gawan tep*[1]) was then added in a band encircling the top about 1 cm. from the edge. The band was 1 to 2 cms. wide, the quills standing vertical, black, red, and green alternating. The quill (*gitthtgatsit gitthe*, porcupine) was

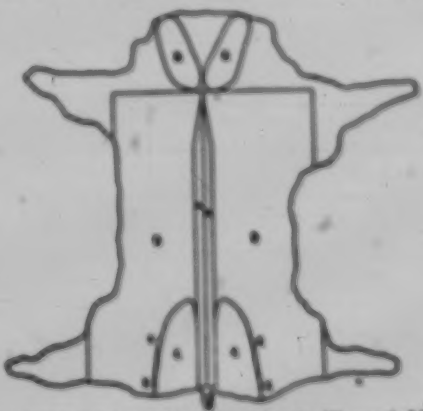

Fig. 44. Distribution of the Pattern for the Woman's Moccasin.

flattened before it was applied.[2] Men's moccasins were usually painted red, but there was no other decoration, appendages, etc.

The woman's moccasin (*gat'cimkhagd'*) has a two piece upper, a toe piece and tongue in one, and a long ankle flap.[3] This flap is worn wound around the ankle, not the calf as Pueblo women wear it. The single tie-string is wound over this and its loose end tucked under a fold. The pattern is distributed as shown in Fig. 44. The deer hide is folded lengthwise and split from tail to neck. Tie-strings (A), 2 to 3 cm. wide, are cut. The contour of the sole (B) is marked on the folded, thick neck skin but each sole is cut out separately. The toe and tongue piece (C) are marked on the next thickest part of the skin, the withers, using an old upper as a pattern. A leaf of narrow-leaf yucca is chewed into the edge of the sole.

[1] The method of coloring these is forgotten.
[2] This is in general the Hopi pattern described by Winslow, (a), 100.

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291 294 so that it can be turned up and puckered. Sinews are chewed and rolled on the thigh. The toe-tongue is then sewed to the sole with these, beginning at the toe and working toward both sides (Fig. 43). The stitching is concealed; the sinew passing but partially through the two pieces of hide. The ankle flap (D), from which legs and fragment of neck are roughly trimmed, is fitted to the leg; a line being drawn on it around the level between the midpoints on each side of the foot (E). The ankle piece is now sewed to the sole along this line; the long free end being on the inside of the foot. Little reinforcement thongs are inserted on each side where the uppers meet the sole. The upper edge of the ankle flap is serrated; this edge is turned down outside when the flap is bound about the ankle.

Fig. 43 (30.2-1280a). A Buckskin Overshoe for use in Snow.

An overshoe (*nakaspákudeé*) for use in the snow[1] is made of an oval piece of buckskin extending 15 cm. beyond the sole on all sides. A thong runs through holes around the edge. This is stuffed with soft, crushed cedar-bark and drawn up around the moccasin. These are also attributed to the Walapai. Another type (Fig. 43) but little larger than the ordinary moccasin is really a one-piece moccasin to which a hard sole has been added. The upper is sewed from toe to instep and part way up the heel. This leaves two flaps which fold about the ankle above the tie-thong which is threaded through holes cut but a little above the sole.

Personal Ornamentation

302 Havasupai styles of personal decoration are not extravagant: hair dressing, painting, and tattooing are only moderately developed.

Men wear their hair full length, to the small of the back, parting it front and back at the ears. The front hair is banged across the forehead just below the eyebrows, leaving the hair at the temples to be cut off on the level of the nipples. The long back hair is bundled back and forth on itself to lie at the nape: the knot (*gúdakdeé*) is bound around with [439] a fillet,[2] a woven ribbon of Hopi or Navaho manufacture, or a band of [301] buckskin. The last is broad enough (6 cm.) to conceal the entire knot

[1] Netted snowshoes are not known.
[2] Cushing, (a), 548.

462 that his womenfolk may have assisted in this casual way in former times
[478] when hides were tanned in plentiful supply for trade that would benefit the
[281] whole family.

Clothing manufacture was men's work, and a man cut and stitched for
[294] himself and all his dependents. However, as might be expected, influences
brought a reversal of sex roles in this occupation. Availability of woven
[177] materials and of ready-made clothing brought a change of style also.
Cotton dresses at first were stitched by hand, but today a few women use
treadle sewing machines. Spier (personal communication, 1957) records
[114] that there were a couple of treadle sewing machines in use in 1918. All
men's clothing and much of that worn by women is purchased ready-to-wear.

As mentioned previously, puberty dresses continued to be made by men
as long as they were in vogue, and a few of the older men still know how to
make them.

The art of chipping stone points has been in disuse for so long that
[324] several informants denied that the Havasupai ever made them. One old
[821] man explained that old men in his youth told him that points for arrows and
spears came down to the earth on lightning, fell on trees, and slid to the
ground unbroken for Havasupai use. Another man said that the Havasupai
obtained stone points by picking up those shot at them by Apaches.

At the present time, points of fine workmanship and a variety of types
and sizes may be picked up in the canyon, but younger informants urged me
not to let the older people know I had collected any. As one woman
[775] phrased it, "In the old days they belonged to people who are dead, and it
might bring a ghost around if you handle them." The same request was
made concerning potsherds, which abound in a profusion of types. However,
an archeologist was able to obtain permission to excavate in the canyon a
couple of years later.

Women's Work

Women, exclusively, plaited sleeping mats, while both men and women
braided yucca or tanned hide rope. It is likely that both sexes had a hand
in preparation of materials and fabrication of the rubbed cedarbark slow
match and of braided cotton cord which formed part of the strike-a-light.
Springs and mattresses, hemp or nylon rope, and matches have replaced
these articles, although young boys and men occasionally braid quirts.
[177] Women commonly made rabbitskin blankets, now no longer used, but they
[297] were sometimes assisted by old men. Cradleboards, still used for every
baby, are made by women who also prepare the materials, but a woman
may send her husband to gather willows for this purpose.